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August 28, 1989

VIA FEDERAL EXPRESS

Mr. R. Nick Wheeler, Jr.
1912 Shady Branch Trail
Richmond, Virginia 23233

Re: Peterson v. Union Carbide Corporation

Dear Nick:

Enclosed please find draft answers to the plaintiff's Supplemental Interrogatories in this matter. I would appreciate it if you would review same and complete the follow-up with Mr. Bowles and others as soon as possible so we can finalize the answers. I will call you later in the week to see how you are doing in your review.

As usual, thanks for your help.

Sincerely,

Robert L. Hollingshead
ROBERT L. HOLLINGSHEAD (RH)

RLH:lh
Enclosure

✓ cc: John Downey, Esq.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

UCC 088562

DRAFT

LTF
Peterson - ICC
COLL
SUPERIOR COURT OF NEW JERSEY
LAW DIVISION: MIDDLESEX COUNTY
DOCKET NO. L-060148-87

JOHN PETERSON and SHIRLEY MAE
PETERSON, his wife,

Plaintiffs,

vs-

UNION CARBIDE CORPORATION,
etc.,

Defendant.

:
:
: Civil Action
:
: DEFENDANT'S ANSWERS TO
: PLAINTIFFS' SUPPLEMENTAL
: INTERROGATORIES

Defendant Union Carbide Corporation ("UCC") responds to
plaintiffs' Supplemental Interrogatories as follows:

1. UCC believes that the letters OTD mean Outerbridge
Terminal and Distribution.
2. This Interrogatory is unclear as to "estab-
lished." Neuberne Brown served as the first president of OTD.
See also answer to initial Interrogatory No. 17.
3. This Interrogatory is unclear as to "property."
The facility was paid for and constructed by UCC. [RLH: check
with John Downey].
4. Neuberne H. Brown was the first president of OTD.
5. On present information and belief, Mr. Brown had
not previously been employed by UCC.
6. No. OTD was a separate entity from UCC.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

UCC 088563

7. No. [N.W.: check with Mr. Bowles].

8. UCC had a portion of its products handled by OTD or ATC to secure lower distribution costs for bulk containers traveling by water.

9. OTD was a corporation. UCC does not understand what is meant by "the corporation franchise" and, therefore, cannot respond to that portion of the Interrogatory.

10. UCC objects to this Interrogatory because it is irrelevant to this cause of action and it is burdensome for UCC to obtain information about another entity from 29 years ago.

11. On information and belief, Neuberne Brown was not a former employee of UCC. UCC is not presently aware of whether other officers, if any, had been former UCC employees.

12. UCC objects to this Interrogatory as being unclear and incapable of a response in its present form. Accordingly, it cannot respond to the phrase "and how many bags were filled from these hoppers during the course of a given day."

As to the relationship between OTD, ATC and UCC throughout the period of the existence of OTD and ATC, there was no corporate relationship between these entities. In this regard, see the answer to Interrogatory No. 137 in the first set answered by UCC. OTD was organized as a separate corporation in approximately 1960 to serve as a terminal for the storage and reshipment

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

X

of som UCC products. ATC is the successor to OTD and was organized on December 1, 1971.

Because UCC purchased the services of OTD and subsequently ATC as operators of the bulk terminal and distribution facility, there was no relationship except as buyer (UCC) and seller (OTD or ATC).

13. OTD ceased to exist on November 31, 1971. There was no plant closure.

14. UCC believes that the shutdown date for ATC was 1986. [Other records are being sought and N.W. will check with Bowles].

15. UCC is aware of one OSHA inspection at ATC, conducted on July 15, 1976. ATC made a copy of the OSHA inspection report available to UCC. A copy of that OSHA report is attached hereto as Exhibit A. [N W: check with Bowles]

16. UCC objects to this Interrogatory as being irrelevant to this action, which concerns the alleged exposure of the plaintiff at the OTD/ATC facility in Perth Amboy, New Jersey. Thus, the subject of OSHA inspections at UCC's Texas City facility is neither relevant nor reasonably calculated to lead to the discovery of admissible evidence.

17. UCC is not aware of any NIOSH inspections at ATC. [Wheeler will check with Bowles].

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

X

18. UCC objects to this Interrogatory for the same reasons set forth in its objection to Interrogatory No. 16.

19. UCC is not aware of any "correspondence" on this subject, but ATC did provide UCC with reports of employee VCM exposure monitoring conducted by Gollob Analytical Service Corp., as stated in the answer to Interrogatory No. 86.

20. The request is unclear as to the type of data sheets needed. [RLH to obtain copies of MSDS that were provided in Maliko and will check with Downey for MSDS on products in issue].

21. UCC objects to this Interrogatory as being vague and unclear, particularly as to the phrase "in relation to any other chemical besides PVC that was shipped from Union Carbide." Notwithstanding this objection, but without waiving the same, the composition of PVC that was shipped from UCC to OTD and ATC from 1966 to 1986 was generally described in the answers to initial Interrogatories Nos. 7, 9 and 86.

22. In this Interrogatory and others, plaintiffs ask for information about PVC resins shipped by UCC to OTD/ATC from 1967 through 1986. UCC notes that no shipments of any form of PVC were made to ATC after mid-1981. Suspension and nonsolvent PVC were not shipped to ATC after 1977. From 1977 to mid-1981 only solvent PVC was shipped to ATC. Dispersion PVC was never shipped by UCC to OTD/ATC.

X

In Rider 51 to UCC's answers to plaintiffs' initial Interrogatories, an attempt was made to list some of the problems that were encountered in the early 1930's in the manufacture of PVC. These problems were controlled by UCC around that time and, accordingly, these contaminants were not present in PVC shipped to OTD/ATC between 1967 and mid-1981.

23. Rider 56 to UCC's answers to plaintiffs' initial Interrogatories contains the best estimates available for the residual monomer contained in the PVC shipped to ATC. Although reliable methods of analysis became available in late 1974, lot identification of resin shipped to ATC was not maintained. Thus, any analytical data available after 1974 cannot be used to show residual vinyl chloride content of product shipped to ATC.

Rider 65 to the UCC's answers to plaintiffs' initial Interrogatories contains the best data available on the respirable particle content of UCC resins. The manufacturing process included the use of cyclone collectors, which minimized the respirable content of the product. Additionally, any remaining respirable particles were separated from the product and discharged with the dryer air exhaust. [RLH re-drafted N W's draft response. N W should check for accuracy.]

24. See Rider A attached hereto.

25. See the answer to plaintiff's initial Interrogatory No. 19.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

X

26. The average holding or storage period at Texas City for PVC to be shipped to OTD/ATC was 6 days.

27. PVC resin was stored in bins and ship containers at Texas City before shipping.

28. The storage area at Texas City was open to the ambient air and the prevailing wind, but the PVC was in metal bins and containers.

29. Product was loaded into bulk ship containers holding 40,000 to 50,000 pounds and shipped to Perth Amboy as a deck load on a ship.

30. Transit time from Texas City to Perth Amboy was at least 7 days by ship. No shipments were made by rail or by truck. The average storage time for containers at OTD/ATC was 19 days.

31. The Interrogatory is unclear as to what "radon samples" are. No radon or other tests were ever made for radioactivity.

32. Air samples were not taken on the ship while in transit from Texas City to Perth Amboy because the product was in ship containers.

33. Not applicable.

A

34. (a) The Interrogatory is unclear as to the air to be measured for free monomer. Analysis of the work space air at UCC's Texas City plant is irrelevant to this suit. There was no measurement of free monomer in the PVC when it arrived at OTD/ATC. Testing of work space air was done by ATC at various times, as shown in answer to Interrogatory Number 19.

(b) The amount of free VCM in resin in parts per million by weight is discussed in the answer to Interrogatory No. 23.

35. A heat sealer was used on each bagging line at Perth Amboy to close the bags of resin. [Wheeler will check with Bowles to see if heat sealer was taken out].

36. UCC is unaware of any analysis of VCM in the air of the bag room prior to the heat sealer being used. Heating PVC resin to its decomposition temperature yields fumes of hydrogen chloride but essentially no VCM.

37. UCC objects to this Interrogatory as being irrelevant to this suit inasmuch as the alleged exposure of the plaintiffs did not occur in UCC's manufacturing facility. Hence, the information is neither relevant nor reasonably calculated to lead to the discovery of admissible evidence.

✓ 38. UCC is searching for and will provide such VCM and PVC toxicology abstracts from 1978 to 1986 that are in its possession. See Exhibit B attached hereto. [Add Doll's report

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

X
and check with John Downey regarding Dr. Kuryla and Marvin Huffman].

39. In answer to Interrogatory No. 70 of the original Interrogatories, UCC discussed protective clothing in its plants and not in OTD/ATC. UCC is presently unaware of what protective clothing was available at OTD/ATC.

40-49. UCC has no knowledge of the practices that are the subject of these Interrogatories.

50. See Rider B attached hereto.

51. UCC objects to this Interrogatory as being irrelevant to this suit, which concerns alleged exposure to the plaintiff at the OTD/ATC facility in Perth Amboy, New Jersey. Thus, the subject of respirators at UCC's Texas City facility is neither relevant nor reasonably calculated to lead to the discovery of admissible evidence. Notwithstanding this objection, but without waiving same, UCC responds as follows. With regard to respirators, see the answer to Interrogatory No. 70 in the Initial Interrogatories. The form of respirator was a Scott Air-Pak or similar self-contained breathing apparatus. As to clothing, UCC employees were provided with cloth coveralls where clothing could be dusted with PVC. Cloth clothing need not be used by an employee when handling VCM because it is a gas.

52. Yes. Commencing in approximately 1930, UCC collected available studies on VCM, PVC and other chemicals. These

studies were maintained at UCC's headquarters in New York City and also at Mellon Institute in Pittsburgh, Pa., where UCC had established the Chemical Hygiene Fellowship in 1937. Additionally, from 1961 through the late 1970's, VCM and PVC studies were collected and maintained at UCC's South Charleston, West Virginia facility.

53. See answer to Interrogatory No. 52.

54. UCC supplied to OTD/ATC various pieces of information regarding the toxicity of VCM/PVC and the protection of employees. This information included Material Safety Data Sheets (or Chemical Safety Data Sheets) commencing in about 1970; the proposed NIOSH standard in January 1974; the OSHA temporary standard on exposure to VCM in April 1974; a booklet entitled Monitoring the Concentration of Vinyl Chloride in the Work Place or Ambient Air in 1975; the OSHA permanent standard in August 1974; and copies of training materials that were used to train UCC employees. Copies of these materials are attached as Exhibit C. [Wheeler will check with Bowles for anything else].

55. UCC was not involved in any meetings at OTD or ATC to discuss working conditions. [What about meeting between Dave Romaine of ATC and Tom Archer of UCC? Wheeler will check with Bowles].

56. See the answer to Interrogatory No. 54. [Check the Romain/Archer connection and discuss with Bowles].

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

X

57. See the answer to Interrogatory No. 22, in which the relevant dates of delivery of PVC resin are set forth. As to the amounts shipped, see answer to Interrogatory No. 31 in the initial Interrogatories.

58. UCC does not understand what is meant by "persons inside the area of the Perth Amboy plant." If the phrase refers to employees of OTD and ATC, see the answer to initial Interrogatory No. 93. If it refers to other persons, further clarification is needed before UCC can respond.

59. See answer to Interrogatory No. 58.

60. UCC was informed that such a request was made to NIOSH.

(a) On information and belief, November 11, 1976.

(b) OSHA made an inspection, the result of which is contained in the report attached to these answers as Exhibit B.

(c) Unknown to UCC.

(d) UCC was made aware of the result by ATC and provided with a copy of the report.

61. No.

62. Emil Borch held several portions at OTD/ATC, including safety engineer and plant manager.

2

63. See the answer to Interrogatory No. 54.

64. UCC objects to this Interrogatory on the ground that it is irrelevant to this cause of action. Notwithstanding this objection, but without waiving same, UCC responds as follows. The Society of Plastics Industry brought an action against OSHA seeking modification of the OSHA standard to exposure to vinyl chloride, 29 C.F.R.F. 1910.93q, dated October 4, 1974. UCC, as a member of that organization, was a participant in the action.

(b) SPI and its members believed the proposed standard was not feasible.

(c) The request for a copy of the opinion in this action is burdensome and not related to this action.

65. This Interrogatory is not clear as to whose "workers", i.e. UCC or ATC, and as to the definition of inert. Without better definition of terms this Interrogatory cannot be answered, except that it is irrelevant if it refers to UCC's employees.

66. See the answer to Interrogatory No. 22, in which the relevant dates of delivery of PVC resin are set forth. During that time period:

(a) PVC resin was shipped to ATC in ship containers holding 40,000 to 50,000 pounds depending on the bulk density of the PVC.

(b) All PVC resin shipped to ATC was handled in bulk.

(c) UCC shipped PVC resins produced by the suspension process (shipped to OTD/ATC from 1966 through 1977), the UCC bulk process (shipped to OTD/ATC from 1966 through 1977) and the solvent process (shipped to OTD/ATC from 1966 through mid-1981).

(d) See answer to (c).

(e) See answer to (b).

(f) See answer to (b).

(g) Yes.

(h) The solvent material that was bagged at OTD/ATC was essentially free of residual VCM. The nonsolvent material that was bagged at OTD/ATC contained very low concentrations of residual VCM.

67. The Interrogatory is unclear and cannot be answered in its present form.

68. See answer to Interrogatory No. 67.

69. Bag material is PVC resin contained in multiwall kraft paper bags usually containing 40 to 50 pounds. Bulk resin is PVC resin handled or contained in bins, ship containers, railroad hopper cars or hopper trucks.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

70. The PVC resin handled at OTD/ATC could be described as a sand-like white powder.

71. Yes.

72. In addition to the Popow article, UCC was also aware of the following articles regarding inhalation of particles of PVC dust:

(a) Szende, C. K. et al: "Pneumoconiosis Developing after Inhalations of Polyvinyl Chloride." Orv. Hetil 112:85-6 1971.

(b) Frongia et al: "Experimental Pulmonary Lesions from Prolonged Inhalation of PVC Powders in the Working Environment" La Medicina del Lavoro Vol. 65 1974.

(c) Adams, W.G.F. and Purchase, I.E.H.: "Is PVC Dust a Hazard?" Unpublished Communication, Imperial Chemical Industries Ltd., Welwyn Garden City, Herfordshire, England July 23, 1975.

(d) Nature, "Biological Reactivity of PVC Dust." Vol. 56 1975
‡

(e) New Scientist, "PVC Dust Fells Factory Mice Suggesting a New Work Hazard." June 1975.

(f) Gamble, J. et al: "Effect of Occupational and Nonoccupational Factors on the Respiratory System of Vinyl

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

Chloride and Other Workers." Journal of Occupational Medicine
Vol. 18 No. 10 1976.

(g) Agarwal, et al, "Some Biochemical and Histo-
pathological Changes Induced by Polyvinyl Chloride Dust in Rat
Lung." Environmental Research Vol. 16 1978

(h) Arnaud et al: "Polyvinyl Chloride Pneumo-
coniosis" Thorax Vol. 33, 1978

Based on the foregoing papers, UCC concluded that the
only PVC particles that could be ingested into the lungs of work-
ers were those produced by the emulsion or dispersion PVC pro-
cesses, which are not involved in this litigation.

73. See the answer to Initial Interrogatory No. 25.

74. See the answer to Initial Interrogatory No. 25.

75. See the answer to Initial Interrogatory No. 23.

76. See the answer to Initial Interrogatory No. 23.

77. There is no Interrogatory No. 77.

78. UCC's employees performed no tests. All work of
this type was performed on UCC's behalf by the Chemical Hygiene
Fellowship, which UCC established at Mellon Institute, Pitts-
burgh, Pa., as shown on the attached Exhibit D. [attach exhibit
from Maliko 4th Supp. Rgs].

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

79. UCC maintained no laboratory facilities for toxicological testing. All laboratory testing was done on UCC's behalf by the Chemical Hygiene Fellowship, Mellon Institute, Pittsburgh, Pa. For the tests performed by the Fellowship, see the answer to Interrogatory No. 18.

80. Yes. UCC was first aware of the existence of residual vinyl chloride monomer (RVCM) in PVC resins in 1933. [The processes for manufacture of PVC resins were not expected to remove all traces of RVCM from the product. The first rough testing for RVCM in PVC resulted from complaints by Armstrong Cork who detected traces of flammable gas in their bulk storage bins. (Circa 1970)].

81. Yes, for the relevant time frame of 1966 to mid-1981, when no further shipments of PVC were made to ATC.

82. See answer to Interrogatory No. 71.

83. UCC was aware of the Goodrich cases of hepatic angiosarcoma in January 1974 when B.F. Goodrich announced them. Because UCC did not know the details of those cases, it could not be said that UCC was "familiar" with them.

84. UCC made VCM exposure studies in its plants, collected all known scientific data on VCM toxicity, cooperated with NIOSH and OSHA in their work, accelerated ongoing toxicity studies at Manufacturing Chemists Association and initiated work to study ways of minimizing VCM exposure. See Rider C attached hereto. [Should we add more from Wheeler report?]

-15-

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

UCC 088577

85. No.

86. UCC did not conduct any tests of the levels of VCM in the bagging resin at OTD/ATC between the relevant years of 1966 and 1981. However, UCC was provided with copies of requests of tests performed by Gollob Analytical Service Corp. at the request of ATC. Copies of those reports are attached hereto as Exhibit D.

87. UCC objects that that portion of this Interrogatory that requests information as to its Texas City plant, for reasons previously set forth. Additionally, PVC is not and has never been considered a carcinogenic agent. The suspect carcinogenic agent was vinyl chloride. From April 1975 onward, UCC provided warning labels as required by the OSHA Standard for Exposure to Vinyl Chloride. [Copies of resin bags were provided in Maliko, but not in copies provided. Warning labels used by ATC should be provided by ATC.]

88. Yes

(a) Bulk containers were labeled as per OSHA in 1975 and onward. See labels attached as Exhibit E. [just first label, second one used on bags].

(b) See the answers to Interrogatory Nos. 20 and 54.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

(c) Stick on labels as per OSHA were delivered to ATC in 1975 until printed bag labels were available. [Wheeler will check with Bowles]

(d) Yes, see Exhibit F attached hereto. [look for item in Maliko].

89. UCC is not presently aware of whether it issued labels for use on pallets containing bags that were shipped by OTD/ATC. [Wheeler will check with Bowles].

90. See the answer to Interrogatory 89.

91. The copy of the label provided was printed by UCC. It was used for labeling PVC as per the OSHA Standard and was placed on bulk containers, hopper trucks, and hopper cars. It may have been used in other ways, as well.

92. The label was first provided for use commencing on April 1, 1975, when the OSHA standard went into effect.

93. The label was printed and used pursuant to the OSHA standard.

94. The smaller label was printed in 1975 by UCC. It was to be placed on all bags containing suspension or non solvent resins until the inventory of bags was consumed and new bags with the imprinted warning were available. The label was to be applied as required by OSHA early in 1975 and onward.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

-17-

UCC 088579

95. See the answer to Interrogatory No. 94.

96. See the answer to Interrogatory No. 94.

97. The OSHA Standard for Exposure to Vinyl Chloride required that bags of suspension and non-solvent resins be so labeled. The Standard became effective on April 1, 1975.

98. See the answers to Interrogatory Nos. 94 and 97.

99. UCC was a member of the Manufacturing Chemists Association for the entire period of 1966 to 1986.

100. The Manufacturing Chemists Association is an organization of chemical manufacturers formed for the purposes of, among other things, exchanging safety information, formulating standards, representing the industry before governmental regulatory bodies, sponsoring research, and providing leadership and guidance in the development of programs promoting ban(?) and safe practices in the manufacture, transportation and safe handling and use of chemical products. One of the best known functions is the CHEMTREC system which provides safety information on bulk chemical shipments. The organization changed its name in recent years from Manufacturing Chemists Association to Chemical Manufacturers Association, but there were no changes in function.

101. UCC became aware of the use of such MCA Chem. Card when they were first used in approximately early 1976.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

102. UCC concluded that vinyl chloride was a cancer suspect agent in January 1974 when B. F. Goodrich established a connection between massive vinyl chloride exposure and hepatic angiosarcoma in humans.

103. See the answer to Interrogatory No. 54.

104. There is only one permanent OSHA standard for Exposure to Vinyl Chloride. This was published in the Federal Register on October 4, 1974 and was made effective April 1, 1975. A copy of this Standard was appended to UCC's answers to the first set of Interrogatories. There was also a temporary OSHA Standard that was promulgated in approximately March, 1974. A copy of that Standard is attached as Exhibit G.

105. Yes.

106. Yes.

107. UCC understands this Interrogatory as requesting studies that were done by UCC or on its behalf by others. With that understanding, see the answer to Interrogatory No. 78.

108. There is no question posed by this Interrogatory.

109. No, but see the answer to Interrogatory No. 118.

110. Not applicable.

111. UCC is presently unaware of any such questionnaire.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

X
112. No.

113. See the answer to Interrogatory No. 112.

114. See the answer to Interrogatory No. 112.

115. See the answer to Interrogatory No. 112.

116. See the answer to Interrogatory No. 112.

117. No, but see the answer to Interrogatory No. 118.

118. UCC became aware of various physical injuries, including cancer, claimed by Eugene Maliko, Arthur Schaffer, Harry Wilkinson and Henry Mazanowski, although all these persons had not actually contracted cancer. It learned of these injuries through litigation directed against UCC commencing in 1976.

119. UCC objects to that portion of this Interrogatory that asserts that Messrs. Maliko, Schaffer, Wilkinson and Mazanowski were UCC employees. They were OTD and/or ATC employees. Also, UCC neither maintained "health facilities" at the ATC plant nor exercised health and safety control of the plant.

120. UCC objects to this Interrogatory as being improper because it seeks information that is privileged under the attorney work-product doctrine. Notwithstanding that objection, but without waiving same, UCC will provide the names of those persons who may have knowledge of relevant facts in this matter, as follows: All parties to the action; all persons identified in the

answers to interrogatories of any party; all persons identified in the deposition of any party or witness; all persons identified in any document produced by a party during discovery; all persons disclosed during the discovery process. [Other persons such as Nick Wheeler, Neuberne Brown, Emil Borch, etc. should be named.]

121. No expert has yet been retained by UCC. When an expert is named to testify at trial for UCC, this information will be provided.

122. Dispersion PVC resins are not involved in this litigation, because none were ever shipped to ATC. Accordingly, the Interrogatory is irrelevant.

123. UCC objects to this Interrogatory as being vague and ambiguous and it cannot respond to the question in its present form.

124. See answer to Interrogatory No. 123.

125. Suspension PVC resin was shipped to OTD/ATC from 1967 through 1977.

126. Solution PVC resin was shipped to OTD/ATC from 1967 through mid-1981. Nonsolvent PVC resin was shipped to OTD/ATC from 1967 through 1977.

127. See answer to Interrogatory No. 123.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

X

128. In 1962, the American Congress of Governmental Industrial Hygienists (ACGIH) recommended that vinyl chloride exposure for workers not exceed 500 ppm for an eight-hour time weighted average (TWA). The limit was believed to cause no adverse effect with repeated exposure.

In 1963, the ACGIH changed its recommendation to a 500 ppm threshold limit value (TLV).

On October 18, 1972, OSHA set the vinyl chloride exposure limit at a ceiling value of 500 ppm.

In 1972, the ACGIH lowered its recommended vinyl chloride standard limit to a 50 ppm ceiling.

On April 5, 1975, OSHA set its temporary vinyl chloride standard limit at a 50 ppm ceiling.

In April, 1975, the OSHA permanent standard became effective, lowering the vinyl chloride exposure limits to 1 ppm maximum for an eight-hour TWA or 5 ppm maximum for any period not exceeding fifteen minutes.

FDA has no authority to establish threshold values for work place exposure. NIOSH is an advisory group and cannot establish threshold values.

129. There is no threshold limit value for RVCM contained in the resin. Accordingly, there is no mathematical relationship between the threshold limit value for VCM and the RVCM

contained in the resin. [Check with Maliko supplemental answers].

130. Vinyl chloride contained in a resin particle is described as parts per million by weight. One part per million could be one pound of VCM in one million pounds of PVC product or in some other dimension such as one gram per million grams. One ppmw could be also said to be 0.0001% by weight.

131. The term ppm has no units. It is a dimensionless ratio.

132. By convention, gases are analyzed volumetrically. Thus, 1 ppm in ambient air is one volume per million volumes. A volume may be milliliters, cubic feet or other volumetric measurement.

133. PPM by volume has no units. It is also a dimensionless number. One part per million by volume is one volume of VCM in one million volumes of air.

134. The conversion factor for air at 20C and atmospheric pressure of 760 mmHg is $\text{mg/m}^3 = 62.5/24.04 \times \text{ppmv}$. If the temperature or pressure deviates from the above significantly, correction factors must be applied for extreme accuracy.

135. UCC used flammable gas detectors of various models up until 1970 when the University of Michigan study of acroosteolysis resulted in a recommendation that employees cleaning

1
reactors not be exposed to VCM in excess of 50 ppm. Since there was no every day control method, UCC's Industrial Hygiene group developed a method based on a measured volume of air aspirated through an MSA colorimetric analysis tube. Other companies used the Century Organic vapor analyzer, but this could be used only when vinyl chloride was the sole air contaminant. In 1974 the need arose for a method of analysis sensitive to 1 ppmv that could be used in the field and for a method of analyses using activated carbon absorption. The VCM was extracted from the activated carbon with carbon disulfide. The solution of VCM and carbon disulfide was injected into a gas chromatograph having a special column. The amount of VCM was determined and the amount of VCM in the air sample calculated. This method continued in use through 1986. UCC also installed automatic gas chromatographs in its PVC plants by 1976 to provide quick analysis of the work space air. [Should this answer be more limited? Did UCC make this available to ATC?]

136. UCC used a chromatograph mass spectrometer combination of instruments for specialized analysis in its research department.

i

(a) The chromatograph-mass spectrometer was used for complicated organic analysis. It was considered a research tool too complicated for control analysis.

(b) Purchase date is not pertinent since it was not used for industrial hygiene testing for vinyl chloride.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

-24-

UCC 088586

(c) See answer to (b).

(d) No.

137. Vinyl chloride homopolymer usually contains 4.8% hydrogen, 38.4% carbon and 56.8% chlorine. A vinyl chloride vinyl acetate homopolymer containing 16% vinyl acetate homopolymer would contain 5.1% hydrogen, 40.8% carbon, 48.9% chlorine and 5.2% oxygen. Resins produced by UCC and shipped to OTD/ATC fall between these ranges.

138. See the table attached hereto as Exhibit H showing shipments of these products to OTD/ATC between 1967/1974. [What about other years? Ask Downey to update?]

139. The point of origin for polyethylene, bis phenol A and polystyrene received at OTD/ATC has no bearing on this litigation and would be burdensome, if not impossible to determine.

140. The polyethylene, bis phenol A and polystyrene were received in ship containers as the deck load on a tanker.

141. See the labels attached as Exhibit I. [See Maliko Second Supp. Rgs No. 19 & 29].

142. UCC objects to that portion of this Interrogatory which contends that UCC shipped "VC," meaning vinyl chloride to OTD/ATC. PVC resins were shipped to OTD/ATC, but not vinyl chloride monomer. Notwithstanding that objection but without waiving same, testing of the work place atmosphere was the re-

sponsibility of the employer, OTD/ATC, which conducted tests through Gollob Analytical Services Corp. Copies of the reports of those tests were provided to UCC and are attached hereto as Exhibit J.

143. See the answer to Interrogatory No. 142.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"